REMARKS

Applicants thank the Examiner for the thorough examination given the present application.

Status of the Claims

Claims 1-10 and 12-16 are pending in the above-identified application. Claims 1, 5, and 10 have been amended. Support for the recitations in claims 1 and 10 can be found in claim 5 as well as in the publication of the present specification, *inter alia*, at paragraphs [0030]-[0038]. Thus, no new matter has been added. Based upon the above considerations, entry of the present amendment is respectfully requested.

In view of the following remarks, Applicants respectfully request that the Examiner withdraw all rejections and allow the currently pending claims.

Statement of the Substance of the Interview

Applicants thank the Examiner for his time during the interview on April 28, 2010. Applicants appreciate the courtesies extended to Applicants' Representative in this application. In compliance with MPEP 713.04, Applicants submit the following remarks.

The Interview Summary sufficiently summarizes the discussions during the interview. Although an agreement could not be reached, Applicants believe that the claims are now in condition for allowance. Should the Examiner believe that there remains any outstanding issues, Applicants respectfully request that the Examiner contact Applicants' Representative so as to expedite resolution of these outstanding issues, via an Examiner's Amendment or the like.

Drawings

Since no objection has been received, Applicants assume that the drawings are acceptable and that no further action is necessary. Confirmation thereof in the next Office Action is respectfully requested.

Issues under 35 U.S.C. § 112, second paragraph

Claims 1 and 10 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Specifically, the Examiner asserts that the phrase "the intermediate reaction product" in claims 1 and 10 lacks antecedent basis. Applicants respectfully traverse in view of the amended claims.

Claims 1 and 10 have been amended to recite "an intermediate reaction product." As such, Applicants respectfully assert that the rejection has been overcome and should be withdrawn.

Issues under 35 U.S.C. § 103(a)

1) Claims 1-6 and 8-9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mizumoto et al. '263 (US 4,631,263).

2) Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Mizumoto et al. '263 in view of Nishino et al. '355 (JP 55-149355).

3) Claims 10 and 12-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yokota et al. '063 (US 4,625,063) in view of Mizumoto et al. '263.

Applicants respectfully traverse. Reconsideration and withdrawal of the rejections are respectfully requested based on the following considerations.

Legal Standard for Determining Prima Facie Obviousness

MPEP 2141 sets forth the guidelines in determining obviousness. First, the Examiner has to take into account the factual inquiries set forth in *Graham v. John Deere*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), which has provided the controlling framework for an obviousness analysis. The four *Graham* factors are:

(a) determining the scope and content of the prior art;

(b) ascertaining the differences between the prior art and the claims in issue;

(c) resolving the level of ordinary skill in the pertinent art; and

(d) evaluating any evidence of secondary considerations.

Graham v. John Deere, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966).

Second, the Examiner has to provide some rationale for determining obviousness. MPEP 2143 sets forth some rationales that were established in the recent decision of *KSR International Co. v Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007). Exemplary rationales that may support a conclusion of obviousness include:

(a) combining prior art elements according to known methods to yield predictable results;

(b) simple substitution of one known element for another to obtain predictable results;

(c) use of known technique to improve similar devices (methods, or products) in the same way;

(d) applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;

(e) "obvious to try" – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success

(f) known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;

(g) some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

As the MPEP directs, all claim limitations must be considered in view of the cited prior art in order to establish a *prima facie* case of obviousness. *See* MPEP 2143.03.

Distinctions over the Cited References

As amended, claims 1 and 10 specifically recite that "said film-type catalyst comprises catalyst particles bound to one another via a synthetic resin as a binder" and that "said particles form a three-dimensional network structure via the binder on a substrate." Accordingly, Mizumoto et al. '263 fail to disclose the substrate as recited in the pending claims.

Furthermore, claims 1 and 10 recite "whereby the diffusion rate in the catalyst layer is increased due to said three-dimensional network structure, and the mass transfer between the inside and outside of the catalyst can be promoted thereby utilizing the whole of the catalyst and

simultaneously suppressing the excessive reaction of an intermediate reaction product in the inside of the catalyst."

The Examiner relies on column 2, lines 27-32 of Mizumoto et al. '263, which states, "When the water-repellent catalyst of this invention is used, it becomes possible that the gas passes not only over the surfaces of the catalyst but also through the interior of the catalyst and, accordingly, three-phase interfaces are easily formed, and the rate of reaction can be increased." As noted above, the present invention utilizes the whole of the catalyst. In contrast, Mizumoto et al. '263 only uses the interior of the catalyst for permeating the gas. Mizumoto et al. '263 fail to disclose that the interior of the catalyst can be used as sites for the reaction. In fact, Mizumoto et al. '263 state that the liquid does not penetrate into the catalyst because of liquid impermeability (col. 2, lines 18-19).

The gas/liquid reactions in the presence of a water-repellent catalyst proceed through the formation of three-phase interfaces on the surface of the catalyst, and the inside of the catalyst is never or scarcely used as sites for the reaction (col. 2, lines 34-38). The gas/liquid reactions that proceed in the presence of a water-repellent catalyst, such as an isotopic exchange reaction between water and hydrogen gas, require a gas and a liquid component to contact with the solid catalyst. Water cannot exchange its hydrogen atoms with hydrogen gas unless it is in contact with the solid catalyst. A water molecule must trap its hydrogen atom at a reaction site on the surface of the catalyst to get a substitute one trapped at another site in order to exchange them. The catalyst assembly of Mizumoto et al. '263 can be effectively utilized by letting the gas permeate the porous interior to reach the surface and then the reaction proceeds through the formation of three-phase interfaces.

In contrast, the present invention is directed to permeability of reactants and products through the porous catalyst layer. Then, the reaction proceeds as evidenced by the comparison of Examples 4 and 5, generating more by-products with a thicker catalyst (see Table 2 on page 43 of the present specification). The reason why a thicker catalyst layer produces worse selectivity of the tertiary amine is explained in the present specification. The present specification recites that "the process of transferring the reactants and the product in the inside of the catalyst is governed by diffusion, and the distance is reduced to 500 μm or less, whereby the mass transfer between the inside and outside of the catalyst can be promoted thereby effectively

utilizing the whole of the catalyst and simultaneously suppressing the excessive reaction of the intermediate reaction product in the inside of the catalyst" (paragraph [0026] of the publication of the present application). If the reaction proceeded only on the surface of the film-type catalyst as on the surface of the catalyst assembly of Mizumoto et al. '263, the thickness of the film-type catalyst would not influence the reactivity.

This phenomenon is illustrated by comparing Example 1 and Comparative Example 1 (see Table 1 on page 42 of the present specification). The difference in the way the catalysts are prepared (which creates a difference in their internal structures) and the difference in thickness of the catalysts lead to very different results for the amination reaction. The film-type catalyst of Example 1 generates 95% of the desired amine with only 4% of undesired amine in five hours. In contrast, the pellet-type catalyst of Comparative Example 1, which has almost thirty times as much in weight as the film-type catalyst of Example 1, generates only 60% of the desired amine with 5% of the undesired amine. **As such, the film-type catalyst of the present invention can utilize the whole of the catalyst and simultaneously suppress the excessive reaction of the intermediate reaction product in the inside of the catalyst. This phenomenon is totally different from Mizumoto et al. '263 as described above.**

As discussed above, Mizumoto et al. '263 do not disclose each and every aspect of claims 1 and 10, from which all other claims ultimately depend. Applicants respectfully submit that Nishino et al. '355 and Yokota et al. '063 do not overcome the deficiencies of this reference.

To establish a *prima facie* case of obviousness of a claimed invention, all of the claim limitations must be disclosed by the cited references. As discussed above, the cited references fail to disclose all of the claim limitations of independent claims 1 and 10, and those claims dependent thereon. Accordingly, the combination of references does not render the present invention obvious.

Furthermore, the cited references or the knowledge in the art provide no reason or rationale that would allow one of ordinary skill in the art to arrive at the present invention as claimed. Therefore, a *prima facie* case of obviousness has not been established, and withdrawal of the outstanding rejections is respectfully requested. Any contentions of the USPTO to the contrary must be reconsidered at present.

Conclusion

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Chad M. Rink, Registration No. 58,258, at the telephone number of the undersigned below to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Director is hereby authorized in this, concurrent, and future replies to charge any fees required during the pendency of the above-identified application or credit any overpayment to Deposit Account No. 02-2448.

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Respectfully submitted,

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